DAWN PATROL

TECHNICAL SUPPLEMENT

IBM PC & COMPATIBLES

Floppy Disk and CD-ROM

empire®
INTERACTIVE

INSTALLATION AND CONFIGURATION

Equipment

To play the PC version of Dawn Patrol you will need:

1. An IBM or 100% compatible PC.
2. Minimum 386 SX with 25 MHz processor or faster (the faster the better!).
3. 485 Kb conventional memory plus at least 70 Kb further conventional or UMB memory (see further comments below).
4. At least 2.2 Mb of expanded memory.
5. VGA or SVGA graphics card.
6. PCDOS/MSDOS 3.0 or above.
7. On the floppy disk version:
   3.5" high-density floppy drive.
   About 14 Mb free hard disk space for the mixed SVGA/VGA version, or 8 Mb for the VGA version alone (plus extra space if you use the in-flight video option).
8. On the CD-ROM version:
   CD-ROM drive.
   At least 400 Kb free hard disk space for minimum installation.

The following equipment is optional:

1. Joystick.
2. Mouse with Microsoft compatible driver.
3. AdLib or Soundblaster compatible audio card.
4. Roland MT32 or LAPC-1.

Installing Dawn Patrol - FLOPPY DISK VERSION

DAWN PATROL comes with its own hard disk drive installation program and it must be played from your hard drive, not from floppy disk.

In this documentation we refer to the floppy drive on your computer as **A:** the hard drive as **C:**. If the drive specifications on your machine are different, then change them as appropriate.

1. Insert your Dawn Patrol Floppy Disk 1 into drive A:. Change to the A: drive by typing **A**: and pressing **ENTER**. Type **INSTALL** and press **ENTER**.

2. After the floppy disc has been accessed, a custom installation screen for Dawn Patrol will be displayed. If you have a multi-language version, then you can select the flag which corresponds to the appropriate language. A window at the bottom of the screen displays the space available on your hard disk. If you have more than one drive on your hard disk, you will be asked to select which one you wish to use.

3. The installation program then asks whether it can install Dawn Patrol to the sub-directory DAWNPTRL. If you would prefer to install to a different sub-directory, then you can insert your specification using your keyboard. Select the CONTINUE icon to proceed.

4. You will now be asked whether you wish to install the VGA and/or SVGA versions of DAWN PATROL onto your hard disk. The VGA version takes up less hard disk space, but uses lower resolution graphics than the SVGA version. Installing both VGA and SVGA will allow you to play Dawn Patrol in a 'mixed' mode: the ground section in high resolution SVGA and the flight section in high speed VGA.

   The lower window shows the base memory, expanded memory and hard disk space available on your system, and compares each one with the memory required by Dawn Patrol. You should ensure that your installation is compatible with the memory requirements of the game when it is run. See the section below called "Memory Requirements" for further information.

5. When you have decided which versions to install you should select the INSTALL icon. The game will now be written to your hard disk, and you should change floppy disks as requested.

6. Once installation is complete you can exit from the installation procedure, and you will be transferred to the subdirectory on which the game is installed.

7. Go to the section called "Loading Dawn Patrol".

8. Put your original disks in a safe place. You might have to re-install the program some time in the future, or you may wish to change the installed graphics mode.

Installing Dawn Patrol - CD-ROM VERSION

DAWN PATROL comes with its own hard disk drive installation program. The CD-ROM version must be run from your hard drive, but you can choose a 'minimum' installation where most game files are kept on the CD-ROM.

This documentation refers to your hard drive as **C:** and your CD-ROM drive as **D:**. If the drive specifications on your machine are different, then change them as appropriate.

1. Insert your Dawn Patrol CD-ROM into the CD drive. Type **D:** and press **ENTER** to log onto your CD-ROM drive, and then type **INSTALL** and press **ENTER**.

2. A custom installation screen for Dawn Patrol will be displayed. If you have a multi-language version, then you can choose which language to install by selecting the appropriate flag. A window at the bottom of the screen displays the space available on your hard disk. If you have more than one drive on your hard disk, you will be asked to select the one onto which you wish to install Dawn Patrol.

3. The installation program then asks whether it can install Dawn Patrol to the sub-directory DAWNPTRL. If you would prefer to install to a different sub-directory, you can insert your choice using the keyboard. Select the CONTINUE icon to proceed.

4. The next installation screen provides a variety of installation options. You may choose to install VGA and/or SVGA graphics. Installing both VGA and SVGA will allow you to play Dawn Patrol in a 'mixed' mode: the ground section in high resolution SVGA and the flight section in high speed VGA.
There is a choice of four different CD installations, depending on how many files you choose to install from the CD onto your hard drive. The minimum option writes the bare minimum of files to your hard drive, and as a result the game will need to access the CD-ROM quite frequently. The normal option is the default setting. The fast option installs most files onto your hard drive, so that there is a minimum of CD drive access. The full installation installs everything onto your hard drive except the recorded voices, which cannot then be accessed.

5. The lower window of this screen shows the base memory, expanded memory and hard disk space available on your system, and compares each one with the memory required by Dawn Patrol. The memory requirements vary between the different types of installation that you choose. You should ensure that your installation is compatible with the requirements of the game when it is run. See the section below called "Memory Requirements" for further information.

6. When you have chosen your installation options you should select the INSTALL icon. The relevant parts of the game will now install onto your hard disk.

7. Once installation is complete you will be transferred to the subdirectory on which the game is installed.

8. Remember that your CD needs to be inserted in your CD drive each time you play Dawn Patrol, unless you install the 'full' option.

Loading Dawn Patrol

1. To start Dawn Patrol, make sure that you are in the subdirectory specified during the installation procedure.

2. To start the game in **VGA** mode, type **PATROL** and press **ENTER**. (Remember that you will not be able to play the VGA version of the game if you have only installed SVGA graphics.)
To start the game in **SVGA** mode for the first time you must first run a program called **SVGATEST** and then follow the instructions in the section below called "Graphics Cards and SVGA Drivers". This will ensure that appropriate graphics drivers for your system are installed before Dawn Patrol is loaded. Once you have successfully run SVGATEST, then you should type **PATROL** and then press **ENTER**. You will not need to run SVGATEST again. (Remember that you will not be able to run the SVGA version of the game if you have only installed VGA graphics.)

3. When you first load the game you will be asked about the graphics mode and the sound cards you wish to use. These options are chosen by typing the number corresponding to the relevant option displayed on the screen. Please ensure that you choose options compatible with your system. Once you are happy with your chosen configuration you will be asked whether or not you wish to proceed - type **Y** if you do or **N** if you don't.

Dawn Patrol remembers your chosen options the next time you load the game, so in future you will not be asked any setup questions. If you wish to alter the default configuration setup then start up the game by typing **PATROL ?** and press **ENTER**.

4. After you have chosen your configuration, you will be presented with the EMPIRE logo followed by a sequence of credits. To terminate this sequence press the **ESC** key. After loading you will find yourself at the start of the game - page one of the Dawn Patrol book. To find out how to proceed follow the information in the main manual.

Memory Requirements

In order to run DAWN PATROL successfully on your PC it needs to have sufficient available memory. The memory requirements vary according to the graphics mode and the graphics drivers you wish to use:

Memory under 1 Mb: 485 Kb (496640 bytes) of conventional memory to load the program,
plus either:
a further 70 Kb (71680 bytes) of conventional or upper memory for VGA
or a further 85 Kb (87040 bytes) of conventional or upper memory for SVGA
(these include the requirements for sound and music)

Expanded Memory: 2.2 Mb for VGA alone
(EMS) or 2.5 Mb for high speed SVGA and VESA drivers
or 3 Mb for the universal VESA driver
(The drivers are installed by running the program SVGATEST - see below.)

The installation procedure of Dawn Patrol identifies the memory usage of your machine. At any other time, you can find even more thorough information by typing MEM followed by **ENTER** at the DOS prompt . The memory figures of interest are "Total under 1 MB - free", and "Expanded (EMS) - free".

The memory under 1 Mb figure given above assumes that further conventional or upper memory is available as one continuous block. It is likely that slightly higher figures would be needed if the memory comes from two or more separate blocks. For example, if you have 540 Kb of conventional memory (485 Kb+55 Kb) and 32K of UMB's free, then you may experience problems running the SVGA version. Estimate an additional 5K for each additional region and ignore regions under 5K when trying to tune your configuration, or try to merge available areas to increase their individual size.

If you do not have sufficient available memory to run Dawn Patrol then you should refer to the appendix of this supplement. Appendix 1 refers to freeing up memory below 1 Mb, and appendix 2 refers to freeing expanded memory.

If you are a user of MSDOS 6.0 or above, you should first consider running the Dos utility **memmaker**. Memmaker attempts to optimise the memory usage of your machine, and can be of considerable help. If you do have to take any of the steps recommended in the appendices you can also consider running memmaker afterwards to optimise the changes you have made.

Graphics Cards and Super VGA drivers

Dawn Patrol should run on any PC with a VGA card, so long as the system conforms to the memory requirements given above. If you have a Super VGA (SVGA) system, then Dawn Patrol can work in the higher resolution 640x400 mode by setting up a special SVGA library for your graphics card. To do this, you should run the program called SVGATEST before running the game for the first time. It is in the same directory as the Dawn Patrol game. Type **SVGATEST** and then press **ENTER**.

You will be asked to identify your SVGA card from a list of alternatives. The program will copy the relevant graphics drivers into the game's graphics library subdirectory, and then attempt to display a graphic screen in high resolution. If this screen displays successfully then you should be able to load the game as detailed above.

If you do not know the make of your graphics adaptor, select "Other" when you are asked for the SVGA card name. Select the "Display Technical Information" option on the next menu, and the program will analyse and display information about the graphics adaptor installed in your system. Re-run the SVGATEST program, this time selecting the correct SVGA card.

If your card type is not listed then it will almost certainly be compatible with the universal VESA option (although you may have to run the VESA TSR provided with older graphics cards first) and may be able to work with the HIGH SPEED VESA option.

There is further information about the graphics drivers in appendix 3.

READ.ME

A text file called **read.me** will have been installed on the game subdirectory of your hard disk. It contains a version of the following appendices, including any updates since the time of going to press. If you have followed all of the installation procedures suggested in this supplement and its appendices, and you are still in difficulty, then you should consult the **read.me** file.

TECHNICAL SUPPORT LINE

If you are still having problems, then check through all of the available information one more time. In the event that your problem is still insoluble, please contact the Empire Interactive Helpline on;

United Kingdom:	**081-343-91433**
United States:	**(301) 916 9303**

APPENDIX 1
Freeing Memory Under 1 Mb

1.1 Introduction

This section describes how you can make enough 'conventional' memory available for Dawn Patrol to run on almost any machine, even with CD-ROM, SVGA, and MUSIC drivers installed. If you are not using MS-DOS, but are using Novell or DR-DOS, then you will have to assume an equivalence when MS-DOS version numbers are mentioned.

1.2 Security boot disk

To release memory for Dawn Patrol and other games you will have to edit your CONFIG.SYS and AUTOEXEC.BAT files (setup files). We suggest that you make a 'security boot disk' now. This means that even if your machine stops working as a result of an edit to your setup files, you can use the security boot disk to restore your system.

If you use disk compression such as Stacker or Superstore, and if Dawn Patrol is installed onto the compressed drive, then you must follow the instructions provided with the compression software on how to make a boot disk that lets you access the compressed drive.

To make a security boot disk from the DOS prompt, you will have to create a 'system disk' containing the setup files as follows.

1) Insert a blank floppy disk into the disk drive
2) Type **FORMAT /S A:** and press **ENTER**.
3) Type **MD A:\OLD** and press **ENTER**.
4) Type **COPY C:\AUTOEXEC.BAT A:\OLD** and press **ENTER**.
5) Type **COPY C:\CONFIG.SYS A:\OLD** and press **ENTER**.
6) Remove the floppy disk from the drive

Follow this procedure if you ever need to use the security boot disk:

1) Insert the security disk into the disk drive.
2) Reboot your PC.
3) Type **COPY A:\OLD\AUTOEXEC.BAT C:\** and press **ENTER**.
4) Type **COPY A:\OLD\CONFIG.SYS C:\** and press **ENTER**.
5) Remove the floppy disk from the drive.
6) Reboot your PC.

Your machine should now be restored to its previous setup condition.

1.3 Game boot disk

Sections 1.4 and 1.5 contain advice on how to modify the setup files AUTOEXEC.BAT and CONFIG.SYS. You must decide whether or not to make these changes on your C: drive, or on a special floppy disk from which to boot your PC when playing Dawn Patrol (i.e. create a 'game boot disk').

Editing the setup files on your C: drive will affect your machine every time you boot from the hard drive. Setup files on a game boot disk are only effective when it is used to boot your system.

Some of the suggested edits will work with all of the software you regularly use, and they can be included on your C: drive setup files without any difficulty. Others will be incompatible with some software. For this reason we recommend that you make your original setup changes on a game boot disk. In the following text, we will assume that such a disk is being used. You may prefer, rather than to delete a line completely, to place a REM statement at the start of the line. Any line starting with a REM statement will not be interpreted by your PC.

To make the game boot disk:

1) Insert the security floppy disk in the disk drive.
2) Type **COPY C:\AUTOEXEC.BAT A:** and press **ENTER**.
3) Type **COPY C:\CONFIG.SYS A:** and press **ENTER**.
4) Type **EDIT A: CONFIG.SYS** and press **ENTER**. (This command invokes the MSDOS editor - you can use any equivalent text editor.)
5) Change all lines starting:

DEVICE=\something into **DEVICE=C:\something**.
and/or **DEVICEHIGH=\something** into **DEVICEHIGH=C:\something**
and/or **INSTALL=\something** into **INSTALL=C:\something**
and/or **INSTALLHIGH=\something** into **INSTALLHIGH=C:\something**
and/or **SHELL=\something** into **SHELL=C:\something**

6) Save the file as CONFIG.SYS
7) Type **EDIT A:AUTOEXEC.BAT** and press **ENTER**.
8) Insert a new line at the start which reads:
   C:
9) Save the file as AUTOEXEC.BAT.

If you reboot your PC with this floppy in the disk drive it will take longer to boot than usual, but otherwise there should be no difference.

If this is successful then you can proceed. From now on the files AUTOEXEC.BAT or CONFIG.SYS are meant to refer to those on your bootable floppy disk.

1.4 CONFIG.SYS and AUTOEXEC.BAT

This section deals with the likely contents of both your setup files. Please try and identify the equivalent lines so that they can be modified as suggested here and in the next chapter (section 1.5).

Load your CONFIG.SYS file into an editor.

(1) Identify which 'memory manager' is used. This is most likely to be either EMM386, or you may have purchased QEMM386 or 386MAX:

EMM 386 will be invoked from your DOS subdirectory with the lines:

```
Device=c:\dos\himem.sys
Device=c:\dos\emm386.exe
```

or from your WINDOWS subdirectory with the lines:

```
Device=c:\windows\himem.sys
Device=c:\windows\emm386.exe
```

QEMM386:`Device=c:\qemm\qemm386.sys`

386Max: `Device=c:\386max\386max.sys`

(2) A lot of conventional memory can be freed up (if you are using DOS 5 or DOS 6) by placing DOS in upper memory. If your CONFIG.SYS file does not contain the following line, add it:

```
DOS=HIGH,UMB
```

(3) To minimize the size of DOS and still be able to run Dawn Patrol then include the following lines (or modify them if similar ones exist):

```
      FILES=10
      BUFFERS=30    (in DOS 5 or 6)
or    BUFFERS=30 /x(in DOS 4)
or    BUFFERS=1     (in DOS 3)
      FCBS=1,0
      STACKS=0,0
```

(4) You may have disk caching software to speed access to your hard disk and/or CD:
CONFIG.SYS may contain `DEVICE=C:\DOS\SMARTDRV.SYS`

AUTOEXEC.BAT may contain

```
      SMARTDRV
or    \DOS\SMARTDRV
or    \WINDOWS\SMARTDRV
or    lh  SMARTDRV
or    loadhigh  SMARTDRV
```

Caching software is also provided in NORTON UTILITIES and PC TOOLS, in which case:
CONFIG.SYS may contain:

```
      Device=C:\NU\NCACHE-x.SYS
or    Device=C:\PCTOOLS\PCCACHE.SYS
```

and AUTOEXEC.BAT may contain:

```
      C:\NU\NCACHE-x
or    C:\PCTOOLS\PCCACHE
```

(5) Identify your mouse driver:

In CONFIG.SYS: **device=c:\mouse\mouse.sys**
or
in AUTOEXEC.BAT: **c:\mouse\mouse**
or **c:\dos\mouse**
or **c:\windows\mouse**

(6) To run the CD version of Dawn Patrol you will need one line in CONFIG.SYS and one line in AUTOEXEC.BAT to enable your CD drive:

The line in CONFIG.SYS is provided by your CD manufacturer, and it can vary. It should, however, look like:

Device=c:\cddrv\cddrv.sys /d:"something"

In AUTOEXEC.BAT the line should be:

c:\dos\MSCDEX /L:r /D:"something" /M:xx
or **c:\windows\MSCDEX /L:r /D:"something" /M:xx**
or **c:\cddrv\MSCDEX /L:r /D:"something" /M:xx**

(7) If you run any disk compression then the lines in AUTOEXEC.BAT or CONFIG.SYS associated with disk compression MUST NOT BE DELETED.

(8) If you need to load any 'device drivers' to access your hard disk then the line that loads this driver MUST NOT BE DELETED.

(9) If you have an SBPRO, SB16, or AWE32 soundcard, then you will find additional lines in AUTOEXEC.BAT that reference the C:\SBPRO or C:\SB16 directory. DO NOT DELETE THESE LINES, or the line containing the words **SET BLASTER**, if you want to hear the sound effects and music in the game!

(10) Note that wherever **DEVICE=** is mentioned above, your CONFIG.SYS file might say **DEVICEHIGH**=

1.5 Modifying CONFIG.SYS and AUTOEXEC.BAT

You can now attempt to tune your setup. Try each of these options in turn, and see how much closer you are to the memory requirements. You should make as few changes as possible in order to reach the required free memory.

(a) You should be able to delete any lines not mentioned in section 1.4. They are not required to run Dawn Patrol. Note that other software you use could need those lines in order to run properly. In particular, if you are not using the CD-ROM version of the game, then there is no need to have the CD-ROM drivers installed. The drivers use quite a lot of conventional memory.

(b) If you are using the CD-ROM version, then you can reduce the size of your CD driver (see section 1.4.6). Find the line in AUTOEXEC.BAT for MSCDEX. Search for the parameter /E. If it is not there then add it, as it will allow the driver to use EXPANDED memory for its internal buffers. You may now be able to increase the /B:xx parameter which defines how much memory is used to buffer CD accesses.

(c) Some software 'grows' when loaded high in UMBs, using more memory than it does when loaded in conventional memory. In particular, some CD drivers have this problem. Try changing **DEVICEHIGH/x=** to **DEVICE=** in CONFIG.SYS, and try removing LOADHIGH or LH from the front of commands in AUTOEXEC.BAT. If the total below 1Mb increases, then your only worry is whether there is at least 475 Kb of conventional memory left for loading the program. If you don't have this conventional memory, you will have to selectively reverse these changes and identify which software 'grows' when loaded in UMBs.

(d) EMM386.EXE (see section 1.4.1) can be modified to give DOS users more memory.

You should be able to configure your memory so that the total available upper memory is at least 96 Kb.

(1) Ensure that EMM386 is not set to OFF or AUTO (it is set to ON by default).
(2) Unless you need to use the UNIVERSAL VESA SVGA driver in the game (see appendix 3), then

DOS 5 and 6 users can use the RAM parameter to provide access to both upper memory and expanded memory.

(3) Any X= statement, which prevents access to a range of segment addresses for network cards or scanners, should be removed. (Dawn Patrol does not access this hardware, but remember that you will need to use different setup files to access them.) Do NOT remove any X= statements required by your disk controller.

(4) DOS 5 or 6 users can specify a range of segment addresses with the command **I=B000-B7FF** and this will give 32K extra memory. DOS 5 users will NOT normally be unable to run WINDOWS with this parameter set. DOS 5 users (apart from PS2-users) may also add **I=E000-EFFF** to get 64K extra memory.

(5) Place the page frame at one end of the parameter range to provide contiguous memory. The parameter **FRAME=C800** or **FRAME=E000** will do this.

(e) Disk caches (see section 1.4.4) speed up disk access, but can take up a lot of memory. For instance, SMARTDRV.EXE provided with DOS 5 or 6 takes up 20 Kb. Removing this line will save memory, but will slow disk access slightly. On the other hand, Norton Utilities' NCache-s.EXE will only take 5K, if you use EMS expanded memory.

(f) It is convenient to use a mouse (see section 1.4.5) with Dawn Patrol, but not essential. Removing your mouse driver may free up to 15K. There are special mouse drivers that take very little memory and work mainly from EMS.

(f) In Dawn Patrol, high quality sound effects require a 20K buffer, whereas low quality sound requires only 10K. The in -game music requires a buffer of 13K.

At the start of the game one buffer is declared whose size is the largest of the above three values. Therefore, using low quality sound effects and music will save 7K, and 20K is saved by having no sound and music at all.

(g) The following further modifications to EMM386 will make even more memory available, but all the options described above should be attempted first:

(1) In order to use the UNIVERSAL VESA SVGA driver in the game users may already have had to insert the statement **I=A000-AFFF**. If you don't mind the danger of Dawn Patrol crashing when you exit from the game, but running successfully, then you can also add the parameter **I=B800-BFFF**.

(2) If you are NOT using the UNIVERSAL VESA driver, but still require memory then you may have to remove the RAM parameter and add the parameter **I=B800-BFFF**. Dawn Patrol will still find your upper memory blocks in this configuration even though DOS cannot, so you need only ensure that there is 485K available at the DOS prompt with all your device drivers and TSRs loaded low.

(3) Dawn Patrol can provide support for users of DOS 3 and 4 where EMM386.SYS will accept I= arguments, or users of hardware EMS cards by generating UMBs in the included areas. Try some of the following:

FRAME=E000
I=C800-DFFF or INCLUDE=C800-DFFF - this is worth 96K
I=B000-B7FF or INCLUDE=B000-B7FF - this is worth 32K
I=B800-BFFF or INCLUDE=B800-BFFF - this is worth 32K

These are not guaranteed to work, but may work with some vendor versions.

h) Quarterdeck's QEMM can greatly increase available UMB's, and hence free more main memory by moving and hiding the ROM's. However this 'stealth' technique is not compatible with certain video cards such as CIRRUS. We have found thaf the CIRRUS and some other cards will work under 'stealth' in two different ways which will maximise your UMB's:

1) Including **ST:M FRAME=C000** will mean that the video ROM is hidden, but not moved. The region from D000-FFF0 is then available for 190 Kb of upper memory.

2) Including **ST:M XST=C000 FRAME=C800** will 'un-stealth' the video, but will 'stealth' the system. The region from D800 to FFF0 is then available for 170 Kb of upper memory.

If **ST:F** works with your machine then try disabling shadowing in the boot-up bios options, and try OPTIMIZEing again. We have found that it is often better to stealth over the video ROM using **ST:F FRAME=C000** than over the system ROM using **ST:F FRAME=EC00**. This is because QEMM will often map over parts of the system ROM anyway.

QEMM Stealth version 7 is also able to 'hide' DOUBLESPACE, and move lumps of DOS.

Users of QEMM or 386 MAX should not have major problems finding enough memory, especially with the QEMM stealth features. (We have seen 650,00 bytes at the DOS prompt!)

i) If you are still having trouble creating sufficient memory, then we're stumped!

1.6 Example Configurations

1.6.1 The Hard Disk user

A sample CONFIG.SYS:

```
DOS=HIGH,UMB
DEVICEHIGH=C:\DOS\HIMEM.SYS
DEVICEHIGH=C:\DOS\EMM386.EXE  ON  RAM  FRAME=E000 2500
STACKS=0,0
FILES=10
BUFFERS=30
FCBS=1,0
DEVICEHIGH=C:\MOUSE\MOUSE.SYS
```

(for the universal VESA driver the third line might read:

```
DEVICE=C:\DOS\EMM386.EXE  ON  FRAME=E000  I=A000-AFFF  3000)
```

A sample AUTOEXEC.BAT:

```
@echo off
C:
PATH=C:\DOS;C:\WINDOWS
C:\MOUSE\MOUSE
LH SMARTDRV
```

1.6.2 CD-ROM USERS

A sample CONFIG.SYS:

```
DOS=HIGH,UMB
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE  ON  RAM  FRAME=E000  I=B000-B7FF  2500
DEVICEHIGH=C:\cddrv\cddrv.sys  /D:"name"
STACKS=0,0
FILES=10
BUFFERS=30
FCBS=1,0
DEVICEHIGH=C:\MOUSE\MOUSE.SYS
```

(for the universal driver line 3 might read:

```
DEVICE=C:\DOS\EMM386.EXE  ON  FRAME=E000  I=A000-AFFF  I=B000-B7FF  3000)
```

A sample AUTOEXEC.BAT:

```
@echo off
C:
PATH=C:\DOS;C:\WINDOWS;C:\cddrv
C:\MOUSE\MOUSE
MSCDEX  /L:r  /E  /M:30  /D:"name"
LH SMARTDRV
```

APPENDIX 2

Freeing sufficient expanded memory

If MEM does not report sufficient free expanded memory (EMS), then you should read this section.

If you appear to have no expanded memory at all, you need to put the line

```
DEVICE=C:\DOS\EMM386.EXE  ON  RAM  3000
```

near the top of your CONFIG.SYS on a new line after **DEVICE=C:\DOS\HIMEM.SYS.**

If the line **DEVICE=C:\DOS\EMM386** is present, then see if there is the parameter OFF or AUTO on the EMM386 line. If there is, it should be changed to ON. This will reduce the amount of upper memory, and you may then not have enough memory under 1Mb.

If you have less than the required amount of free expanded memory, then look closely at the screen output of the command MEM:

1) Either the total expanded memory (EMS) or the total extended memory (XMS) should be greater than the amount of memory you require. Otherwise you will have to fit more memory to your machine. A 4MB machine should provide 2,900K of expanded memory, or 3,000K extended memory.

2) If the total extended memory (XMS) is much more than the total expanded memory (EMS), and the amount of free extended memory can make up your memory shortfall, then edit CONFIG.SYS and find the line with

DEVICE=C:\DOS\EMM386.SYS
or **DEVICE=C:\DOS\EMM386.EXE**
or **DEVICEHIGH=C:\DOS\EMM386.EXE**

The number parameter on that line specifies the amount of allocated EMS memory in Kilobytes. Increase that number by a little more than the deficit in expanded memory. Reboot, and there should be sufficient memory available to run Dawn Patrol successfully.

QEMM, 386MAX, DR-DOS and DOS 6 treat EMS and XMS as a common memory pool, unless you have configured with a maximum EMS, so the figures for EMS and XMS will be approximately the same.

3) If you are still in difficulty, then you will have to remove a driver that is using your expanded or extended memory to make room for Dawn Patrol. These include RAM disks and disk caches.

Edit your CONFIG.SYS and AUTOEXEC.BAT files and look for lines starting with the following:

(a) **DEVICE=c:\dos\RAMDRIVE.SYS**
or **DEVICEHIGH=c:\dos\RAMDRIVE.SYS:**

Dawn Patrol does not make use of RAM disks, so this line should be disabled by adding a REM statement at the beginning:

REM DEVICE=c:\dos\RAMDRIVE.SYS

(b) **DEVICE=C:\DOS\SMARTDRV.SYS**
SMARTDRV
or **lh SMARTDRV**
or **loadhigh SMARTDRV**
or **\DOS\SMARTDRV**
or **\WINDOWS\SMARTDRV**

Dawn Patrol can be speeded up by using the SMARTDRV disk cache, but it uses memory. To reduce memory consumption look for a number after the text listed above.

If there is a number specified on the line, then reduce it by the amount of expanded memory you need (all number are in units of Kb). If there is no number then insert 256 (the default is 2,000K). If this does not give enough EMS then comment out the line with a REM statement.

(c) If your RAM disk or disk cache is not SMARTDRV, then a similar approach can normally be followed (e.g. for Norton Utilities or PC Tools).

(d) Finally, search for any other ways in which your extended or expanded memory is being used. Printer buffers and network caches are two examples. Remove them if necessary.

4) It may be that the approach taken in 3) has freed sufficient extended memory, in which case follow the procedure outlined in 2) to change it into expanded memory.

APPENDIX 3
FURTHER GRAPHIC DRIVER INFORMATION

The SVGATEST program provides custom SVGA drivers, a High Speed VESA driver and a Universal VESA driver. The Universal driver should work with most cards, but it is slower than the other two options.

SVGATEST offers a list including the following chipsets:

Cirrus
ET4000
Trident
#9 GXE
ATI Mach 32 - requires that the provided VESA TSR has been run.

We have also included some manufacturers' brand names. In the following list, brand names are matched with their driver:

Hercules Dynamite	ET4000
Genoa 8500VL	Cirrus
Genoa 3989VL-12	ET4000
Trident 8900	Trident
Trident 9000	Trident
Cirrus Logic GD-54xx	Cirrus
Older Diamond Stealth	Vision
Newer Diamond Stealth	ET4000

It is possible that both your chipset and your card manufacturer are specified as separate options. Choose either option in SVGATEST.

The following cards have been tested and work with our High Speed VESA driver:

Cirrus Logic GD-54xx
ET3000
ET4000
Trident
#9 GXE
Older Diamond Stealth
Newer Diamond Stealth
ATI Mach 32

Universal VESA option (low speed)
The following cards have been tested and work with the Universal VESA driver:

S3 cards including Orchid Fahrenheit S3
Pegasus
Paradise - still working on high speed driver (Sept '94)

In order to work successfully with the UniversalVesa Driver, your card must be Local Bus (VLB or PCI). And in order to get an acceptable frame rate in-flight you will need a DX2/66 or Pentium 66 machine.

To run the Universal Vesa option successfully, then you must make ONE of the following edits to your start-up CONFIG.SYS file, depending on which memory management software you are using:

(1) On DOS versions prior to DOS 5, on the line starting **DEVICE=C:\DOS\EMM386.SYS:**
Add the parameter: **i=A000-AFFF**

(2) On DOS version 5 and after, on the line starting **DEVICE=C:\DOS\EMM386.SYS:**
Find, and remove, the word: **RAM**
And add the parameter: **i=A000-AFFF**

Also, if there is a line **DOS=HIGH,UMB** then change it to **DOS=HIGH**. On the other hand, if there is a line **DOS=UMB** then insert **REM** at the start of the line.

Please note that some of your other software may not work after you have performed these edits. In this case we would recommend that you make up a special Dawn Patrol bootable floppy disk (see appendix 1.3).

(3) If your memory manager is Quarterdeck QEMM 386, then on the line starting **DEVICE = C:\QEMM\QEMM386.SYS** add the parameter **VREMS**.

If you do not have a monochrome monitor you can avoid re-running OPTIMIZE by adding the parameter **RAM=B000-B7FF**. Note, however, that unless the extra parameter **X=B000-BFFF** is inserted, WINDOWS will not run properly. If you do this, then you will have 32K less upper memory, and you will have to re-run OPTIMIZE.

(4) For 386 MAX users, identify the line starting **DEVICE=C:\386MAX\386MAX.SYS** and add the parameter **I=A000-AFFF**.